LISTING OF CLAIMS

The following listing of claims replaces all previous versions, and listings, of claims in the application.

1. (Currently amended) A drive circuit for driving a switching element comprising:

a high-side switching circuit connected between power supply lines;

a low-side switching circuit connected in series with said high-side switching circuit through an output terminal leading to the switching element; and

a voltage detector detecting a voltage appearing at the output terminal,

wherein said low-side switching circuit is controlled to be turned off when the voltage detected by said voltage detector is lower than an off-decision voltage which is defined within a voltage range in which the switching element is in an off-state, said high-side switching circuit being placed in an off-state when said low-side switching circuit is placed in an on-state, so that after said low-side switching circuit is brought into the off-state, both said high-side and low-side switching circuits are placed in the off-state.

2. (Original) A drive circuit as set forth in claim 1, wherein said low-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the off-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

3.(Original) A drive circuit as set forth in claim 2, wherein the comparing circuit is implemented by a comparator.

4. (Original) A drive circuit as set forth in claim 2, wherein the comparing circuit includes a decision transistor having a control terminal into which the output voltage detected by said voltage detector is inputted.

5. (Original) A drive circuit as set forth in claim 1, wherein said voltage detector is implemented by a voltage divider made up of resistors.

6. (Currently amended) A drive circuit for driving a switching element comprising:

a high-side switching circuit connected between power supply lines;

a low-side switching circuit connected in series with said high-side switching circuit through an output terminal leading to the switching element; and

a voltage detector detecting a voltage appearing at the output terminal;

wherein said high-side switching circuit is turned off when the voltage detected by said voltage detector is higher than an on-decision voltage which is defined within a voltage range in which the switching element is in an on-state, said low-side switching circuit being placed in an off-state when said high-side switching circuit is placed in an on-state, so that after said high-side switching circuit is brought into the off-state, both said high-side and low-side switching circuits are placed in the off-state.

7. (Original) A drive circuit as set forth in claim 6, wherein said high-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the on-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

8. (Original) A drive circuit as set forth in claim 7, wherein the comparing circuit is implemented by a comparator.

9. (Original) A drive circuit as set forth in claim 7, wherein the comparing circuit includes a decision transistor having a control terminal into which the output voltage detected by said voltage detector is inputted.

10. (Original) A drive circuit as set forth in claim 6, wherein said voltage detector is implemented by a voltage divider made up of resistors.

11. (Currently amended) A drive circuit for driving a switching element comprising:

a high-side switching circuit connected between power supply lines;

a low-side switching circuit connected in series with said high-side switching circuit through an output terminal leading to the switching element; and

a voltage detector detecting a voltage appearing at the output terminal;

wherein said low-side switching circuit is turned off when the voltage detected by said voltage detector is lower than an off-decision voltage which is defined within a voltage range in which the switching element is in an off state, said high-side switching circuit being placed in an off-state when said low-side switching circuit is placed in an on-state, so that after said low-side switching circuit is brought into the off-state, both said high-side and low-side switching circuits are placed in the off-state, and

wherein said high-side switching circuit is turned off when the voltage detected by said voltage detector is higher than an on-decision voltage which is defined within a voltage range in which the switching element is in an on state, said low-side switching circuit being placed in an off-state when said high-side switching circuit is placed in an on-state, so that after said high-side switching circuit is brought into the off-state, both said high-side and low-side switching circuits are placed in the off-state.

12. (Original) A drive circuit as set forth in claim 11, wherein said low-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the off-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

13. (Original) A drive circuit as set forth in claim 11, wherein said high-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the on-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

14. (Original) A drive circuit as set forth in claim 13, wherein the comparing circuit includes a decision transistor having a control terminal into which the output voltage detected by said voltage detector is inputted.

15. (Original) A drive circuit as set forth in claim 11, wherein said voltage detector is implemented by a voltage divider made up of resistors.

16. (Previously presented) A drive circuit as set forth in claim 1, wherein said high-side switching circuit is also controlled to be turned off during the off state of the switching element so that a maximum of 0.1A flows through either said high-side switching circuit or said low-side switching circuit when the voltage detected by said voltage detector is lower than the off-decision voltage.

17. (Previously presented) A drive circuit as set forth in claim 11, wherein said high-side switching circuit is also controlled to be turned off during the off state of the switching element so that a maximum of 0.1A flows through either said high-side switching circuit or said low-side switching circuit when the voltage detected by said voltage detector is lower than the off-decision voltage.

18. (Previously presented) A drive circuit as set forth in claim 1, wherein said low-side switching circuit is turned on for dissipating electric charges from a switching element gate capacitor when the switching element is switched to the off-state.

19. (Previously presented) A drive circuit as set forth in claim 11, wherein said low-side switching circuit is turned on for dissipating electric charges from a switching element gate capacitor when the switching element is switched to the off-state.

20. (Previously presented) A drive circuit as set forth in claim 1, wherein said low-side switching circuit and said high-side switching circuit comprise bipolar transistors that are selectively turned on and off by controlling respective base currents thereof.

21. (Previously presented) A drive circuit as set forth in claim 6, wherein said low-side switching circuit and said high-side switching circuit comprise bipolar transistors that are selectively turned on and off by controlling respective base currents thereof.

22. (Previously presented) A drive circuit as set forth in claim 11, wherein said low-side switching circuit and said high-side switching circuit comprise bipolar transistors that are selectively turned on and off by controlling respective base currents thereof.

23. (Previously presented) A drive circuit as set forth in claim 6, wherein said low-side switching circuit is also controlled to be turned off during the on state of the switching element so that a maximum of 0.1A flows through either said high-side switching circuit or said low-side switching circuit when the voltage detected by said voltage detector is higher than the on decision voltage.

24. (Previously presented) A drive circuit as set forth in claim 11, wherein said low-side switching circuit is also controlled to be turned off during the on state of the switching element so that a maximum of 0.1A flows through either said high-side switching circuit or said low-side switching circuit when the voltage detected by said voltage detector is higher than the on decision voltage.

25. (Previously presented) A drive circuit as set forth in claim 6, wherein said high-side switching circuit is turned on for charging a switching element gate capacitor when the switching element is switched to the on state.

26. (Previously presented) A drive circuit as set forth in claim 11, wherein said high-side switching circuit is turned on for charging a switching element gate capacitor when the switching element is switched to the on state.